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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
TIMORY, KABIR A	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
12/08/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/580,823	IIDA, SACHIO	
	Examiner	Art Unit	
	KABIR A. TIMORY	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *12-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11 and 21* is/are rejected.

7)☒ Claim(s) *9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Respond to Arguments

1. This office action is in response to the amendment filed on 09/22/2009. Claims 1-11 and 21 are pending in this application and have been considered below. Claims 12-20 are withdrawn by the applicant.

2. The rejection under 35 USC 112 2nd paragraph to claims 8-9 is corrected by the amendment. Therefore, the rejection is withdrawn.

3. Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of new ground(s) of rejection because of the amendments.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-7, 11, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Langlais et al. (US 6091932) in view of Erlich et al. (US 20050265220) and further in view of Saito et al. (US 20030081689).

Regarding claims 1 and 21:

As shown in figures 1-18, Langlais et al. disclose a radio communication apparatus which uses a low-intermediate frequency **(see figures 5 and 11)**, said apparatus comprising:

- frequency conversion means for converting the received multiband OFDM signal into a low-intermediate frequency signal **(col 9, lines 35-37)**;
- AD conversion means **(51 in figure 5)** for AD converting the low-intermediate frequency signal into a digital signal using a specified sampling frequency **(col 9, lines 35-38)**; and
- OFDM demodulation **(52 in figure 5)** means for demodulating the digital signal into sequence of sub-carriers **(see figure 11)** along a frequency axis **(see figure 11)** so as to perform fast spectrum analysis **(col 9, lines 35-49)**,
- wherein said OFDM demodulation means **(52 in figure 5)** sorts, after demodulation, the sequence of sub-carriers changed due to the frequency folding **(aliasing fold-in interpreted to be frequency folding)** caused by the specified sampling frequency during AD conversion **(col 4, lines 32-41, col 5, lines 17-29, col 16, lines 5-33)**.

Langlais et al. disclose all of the subject matter as described above except for specifically teaching to receive a multiband OFDM signal for hopping a center frequency at a specified band interval, to induce frequency folding in the digital signal.

However, Erlich et al. in the same field of endeavor teach to receive a multiband OFDM signal for hopping a center frequency at a specified band interval **(figures 3A-3B, par 0021, 0029-0030, par 0078)**. Therefore, it would have been obvious to one

ordinary skill in the art at the time the invention was made to use the method and system frequency hopping in a multiband OFDM system as taught by Erlich et al. to modify the system and method of Langlais et al. in order to overcome severe collisions between transmissions of different networks.

Langlais et al. and Erlich et al. disclose all of the subject matter as described above except for specifically teaching to induce frequency folding in the digital signal.

However, Saito et al. in the same field of endeavor teach to induce frequency folding in the digital signal (figure 2a-d, par 0030-0033, par 0040). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the frequency folding (aliasing) as taught by Saito et al. to modify the system and method of Langlais et al. in order to yield predictable results **(KSR-rationale, combining prior art elements according to known method to yield predictable results)**.

Regarding claim 2:

Langlais et al. further disclose wherein any of fast Fourier transform (FFT), wavelet transform, and Hartley transform is used for said demodulation so as to perform fast spectrum analysis on an OFDM signal **(see the FFT unit 52 in figure 5)**.

Regarding claim 3:

Langlais et al. further disclose wherein said frequency conversion means **(56 in figure 5)** mixes a reception signal with a local signal **(NOC in figure 5)** to generate low-intermediate frequency signal **(col 9, lines 35-49)**.

Regarding claim 4:

Langlais et al. further disclose wherein said frequency conversion means mixes **(56 in figure 5)** a reception signal with a local signal **(NCO in figure 6)** having a local frequency apart from a reception frequency by half of a band interval **(col 15, lines 67, col 16, lines 1-21)** to generate a low-intermediate frequency signal composed of a low-intermediate frequency half said band interval **(col 9, lines 35-49, col 15, lines 67, col 16, lines 1-21)**.

Langlais et al. disclose all of the subject matter as described above except for specifically teaching for frequency hopping.

However, Erlich et al. in the same field of endeavor teach for frequency hopping **(figures 3A-3B, par 0021, 0029-0030, par 0078)**. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the method and system frequency hopping in a multiband OFDM system as taught by Erlich et al. to modify the system and method of Langlais et al. in order to overcome severe collisions between transmissions of different networks.

Regarding claim 5:

Langlais et al. further disclose wherein AD conversion means **(51 in figure 5)** samples analog signals using a sampling frequency twice as high as said low-intermediate frequency **(col 14, 66-67, col 15, lines 1-7)**.

Regarding claim 6:

Langlais et al. disclose all of the subject matter as described above except for specifically teaching wherein AD conversion means samples analog signals using a sampling frequency equivalent to a band interval for frequency hopping.

However, Erlich et al. in the same field of endeavor teach wherein AD conversion means **(11 in figure 6)** samples analog signals using a sampling frequency equivalent to a band interval for frequency hopping **(figures 3A-3B, par 0021, 0029-0030, par 0078)**. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the method and system frequency hopping in a multiband OFDM system as taught by Erlich et al. to modify the system and method of Langlais et al. in order to overcome severe collisions between transmissions of different networks.

Regarding claim 7:

Langlais et al. further disclose an intermediate frequency filter **(BPF in figure 5)** to remove unnecessary waves in an low-intermediate frequency signal frequency-converted by said frequency conversion means **(figure 5 shows that BPF is filtering the IF input signal, also see figure 9)**.

Regarding claim 11:

As shown in figures 1-18, Langlais et al. disclose a radio communication apparatus which uses a low-intermediate **(IF IN in figure 5)** frequency, wherein said apparatus mixes **(56 in figure 5)** a reception signal with a local signal having a local frequency **(NCO in figure 5)** apart from a reception frequency to generate a low-intermediate frequency signal composed of a low-intermediate frequency half said band interval **(col 9, lines 35-49),** and said apparatus AD converts **(51 in figure 5)** the low-intermediate frequency signal to generated a digital signal using a predetermined sampling frequency **(col 9, lines 35-38)**.

Langlais et al. disclose all of the subject matter as described above except for specifically teaching to receive a multiband OFDM signal for hopping a center frequency at a specified band interval and by half of a band interval for frequency hopping, to induce frequency folding in the digital signal.

However, Erlich et al. in the same field of endeavor teach to receive a multiband OFDM signal for hopping a center frequency at a specified band interval **and** by half of a band interval for frequency hopping **(figures 3A-3B, par 0021, 0029-0030, par 0078)**. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the method and system frequency hopping in a multiband OFDM system as taught by Erlich et al. to modify the system and method of Langlais et al. in order to overcome severe collisions between transmissions of different networks.

Langlais et al. and Erlich et al. disclose all of the subject matter as described above except for specifically teaching to induce frequency folding in the digital signal.

However, Saito et al. in the same field of endeavor teach to induce frequency folding in the digital signal **(figure 2a-d, par 0030-0033, par 0040)**. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the frequency folding (aliasing) as taught by Saito et al. to modify the system and method of Langlais et al. in order to yield predictable results **(KSR-rationale, combining prior art elements according to known method to yield predictable results)**.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Langlais et al. in view of Erlich et al. and Saito et al. as applied to claim 7 above and further in view of Malkemes et al. (US20030107986) and Applicant's Admitted Prior Art (AAPA), specification, page 30, paragraph 0078.

Regarding claim 8:

Langlais et al., Erlich et al., and Saito et al. disclose all of the subject matter as described above except for specifically teaching wherein said intermediate frequency filter comprises a Hilbert bandpass filter formed by two real filters interconnected by a gyrator, the two real filters having a same characteristic.

However, Malkemes et al. in the same field of endeavor teach wherein said intermediate frequency filter comprises a Hilbert bandpass filter formed by two real filters **(218 and 220 in figure 2, par 0024 and claim 4)**. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the Hilbert filters as taught by Malkemes et al. to modify the system and method of Langlais et al. in order to extract the positive and negative high frequency components of the complex signal.

Langlais et al., Erlich et al., Saito et al., and Malkemes et al. disclose all of the subject matter as described above except for specifically teaching interconnected by a gyrator, the two real filters having a same characteristic.

However, AAPA in the same field of endeavor teach interconnected by a gyrator, the two real filters having a same characteristic **(in the specification of the instant**

application, in paragraph 0078, the applicant discloses: "<u>There is a known method of using a gyrator to connect the same two real filters so as to realize a Hilbert BPF</u> (also called a complex filter) having the -264 MHz center frequency and the 528 MHz band (e.g., see J. O. Voorman. "The Gyrator as a Monolithic Circuit in Electronic Systems." Ph. D. thesis, pp. 83-103, University of Nijmengen, 1977")) (specification, page 30, paragraph 0078). Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to use the Hilbert filters as taught by Malkemes et al. to modify the system and method of Langlais et al. in order to yield predictable results **(KSR-rationale, combining prior art elements according to known method to yield predictable results)**.

Allowable Subject Matter

7. Claims 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record, Langlais et al. does not teach or suggest wherein a same absolute value is used for a design frequency of a ladder-type low-pass filter as a real filter and for a center frequency of said Hilbert bandpass filer and an integer ratio is used for an element value of a ladder-type prototype filter.

The prior art of record, Langlais et al. also does not teach or suggest wherein the beginning of a reception frame includes a preamble composed of a known sequence;

and wherein there is further provided preamble detection means for detecting a preamble in a reception signal using a sequence resulting from multiplying said known preamble sequence and said low-intermediate frequency together.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KABIR A. TIMORY whose telephone number is (571)270-1674. The examiner can normally be reached on 6:30 AM - 3:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kabir A Timory/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611